

WHAT IS CLAIMED IS:

1 1. A microelectronic package comprising:

2 a microelectronic component having a mounting surface;

3 a substrate having a facing surface; and

4 an attachment layer that is interposed between and
5 bonded to said mounting surface of said microelectronic
6 component and said facing surface of said substrate so as
7 to attach said microelectronic component onto said
substrate;

8 wherein:

9 said attachment layer comprises a layer of an adhesive
10 and plural generally ball-shaped spacer elements dispersed
11 in said adhesive;

12 said spacer elements respectively have a nominal
13 diameter that corresponds to a stand-off distance between
14 said mounting surface of said microelectronic component and
15 said facing surface of said substrate; and

16 said spacer elements comprise a plastic material that
17 is at least slightly elastically flexible and resilient.

18 2. The microelectronic package according to claim 1, wherein
19 said adhesive has a first coefficient of thermal expansion,
20 and said plastic material of said spacer elements has a
21 second coefficient of thermal expansion that at least
22 approximately corresponds to said first coefficient of
23 thermal expansion of said adhesive.

1 3. The microelectronic package according to claim 1, wherein
2 said adhesive has a first coefficient of thermal expansion,
3 and said plastic material of said spacer elements has a
4 second coefficient of thermal expansion that is not less
5 than one tenth of said first coefficient of thermal
6 expansion of said adhesive.

1 4. The microelectronic package according to claim 1, wherein
2 said spacer elements consist essentially of said plastic
3 material, and said plastic material has a coefficient of
4 thermal expansion on the order of 10^{-4} K^{-1} or 10^{-5} K^{-1} .

1 5. The microelectronic package according to claim 4, wherein
2 said coefficient of thermal expansion is in a range from
3 $4 \times 10^{-5} \text{ K}^{-1}$ to $6 \times 10^{-5} \text{ K}^{-1}$.

1 6. The microelectronic package according to claim 5, wherein
2 said plastic material is a mixture or copolymer of at least
3 two different polymers.

1 7. The microelectronic package according to claim 1, wherein
2 said plastic material is elastically flexible and resilient
3 to such an extent so that said spacer elements exhibit an
4 elastic flexible deformability of at least 1% of said
5 nominal diameter in said attachment layer in said
6 microelectronic package.

1 **8.** The microelectronic package according to claim 1, wherein
2 said generally ball-shaped spacer elements respectively
3 have a spherical or spheroidal shape.

1 **9.** The microelectronic package according to claim 1, wherein
2 said nominal diameter is in a range from 150 μm to 200 μm .

1 **10.** The microelectronic package according to claim 1, wherein
2 said spacer elements consist essentially of said plastic
3 material, which consists essentially of a single polymer.

1 **11.** The microelectronic package according to claim 1, wherein
2 said spacer elements consist essentially of said plastic
3 material, which consists essentially of a mixture or
4 copolymer of at least two different polymers.

1 **12.** The microelectronic package according to claim 1, wherein
2 said spacer elements do not contain any silica glass, do
3 not contain any alumina, and do not contain any metal.

1 **13.** The microelectronic package according to claim 1, wherein
2 said attachment layer further comprises an anti-static
3 agent applied to said spacer elements or mixed in said
4 adhesive.

1 **14.** The microelectronic package according to claim 1, wherein
2 said microelectronic component comprises a sensor.

1 15. The microelectronic package according to claim 1, wherein
2 said adhesive is a silicone adhesive.

1 16. The microelectronic package according to claim 1, wherein
2 said attachment layer is formed from a single drop of said
3 adhesive with said spacer elements dispersed therein, which
4 drop has been applied on said facing surface of said
5 substrate at a location centered relative to said mounting
6 surface of said microelectronic component, and which drop
7 then has been pressed between said facing surface and said
8 mounting surface and thereafter cured to form said
9 attachment layer.

1 17. A method of manufacturing the microelectronic package
2 according to claim 1, comprising the following steps:

3 applying a single drop of said adhesive with said
4 spacer elements dispersed therein onto said facing surface
5 of said substrate;

6 placing said microelectronic component onto said drop
7 with said mounting surface centered on said drop;

8 pressing together said microelectronic component and
9 said substrate with said drop therebetween, so as to
10 flatten said drop into a layer until said spacer elements
11 contact said mounting surface and said facing surface; and
12 then

13 curing said adhesive.

1 18. A microelectronic package comprising:

2 a microelectronic component having a mounting surface;
3 a substrate having a facing surface; and
4 an attachment layer that is interposed between and
5 bonded to said mounting surface of said microelectronic
6 component and said facing surface of said substrate so as
7 to attach said microelectronic component onto said
8 substrate;

9 wherein:

10 said attachment layer comprises a layer of an adhesive
11 and plural generally ball-shaped spacer elements dispersed
12 in said adhesive;

13 said spacer elements respectively have a nominal
14 diameter that corresponds to a stand-off distance between
15 said mounting surface of said microelectronic component and
16 said facing surface of said substrate;

17 said spacer elements comprise a plastic material that
18 is at least slightly elastically flexible and resilient;
19 and

20 said adhesive has a first coefficient of thermal
21 expansion, and said plastic material of said spacer
22 elements has a second coefficient of thermal expansion that
23 at least approximately corresponds to said first
24 coefficient of thermal expansion of said adhesive.

1 19. A microelectronic package comprising:

2 a microelectronic component having a mounting surface;
3 a substrate having a facing surface; and

4 an attachment layer that is interposed between and
5 bonded to said mounting surface of said microelectronic
6 component and said facing surface of said substrate so as
7 to attach said microelectronic component onto said
8 substrate;

9 wherein:

10 said attachment layer comprises a layer of an adhesive
11 and plural generally ball-shaped spacer elements dispersed
12 in said adhesive;

13 said spacer elements respectively have a nominal
14 diameter that corresponds to a stand-off distance between
15 said mounting surface of said microelectronic component and
16 said facing surface of said substrate;

17 said spacer elements comprise a material that is at
18 least slightly elastically flexible and resilient; and

19 said adhesive has a first coefficient of thermal
20 expansion, and said material of said spacer elements has a
21 second coefficient of thermal expansion that is not less
22 than one tenth of said first coefficient of thermal
23 expansion of said adhesive.